2007 Vaccine-Preventable Diseases Summary, Utah

Utah Department of Health

January 27, 2009

2007 Vaccine-Preventable Diseases Summary, Utah

Chickenpox (Varicella)

Background

Clinical Description

Chickenpox is an acute rash illness caused by the varicella-zoster virus (VZV). The rash is itchy and generalized, and the lesions soon develop into superficial, delicate vesicles that break, leaving open sores that dry and crust over into brown scabs. The acute disease lasts from 3-5 days, with resolution of the lesions taking 1-2 weeks.

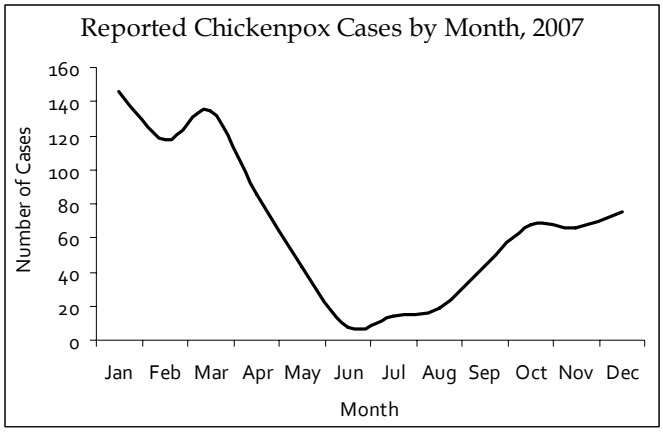
Public Health Responsibility

All cases of chickenpox, regardless of laboratory testing, should be reported to public health. Public health is responsible for promoting vaccination in order to reduce the disease burden on the community, monitoring the impact of vaccination on incidence, morbidity, and mortality, and ensuring the administration of varicella-zoster immune globulin (VariZIG) to prevent illness in high-risk individuals (pregnant women, immunocompromised persons, neonates with infected mothers, and premature infants exposed during the neonatal period).

2007 Utah Summary

Reported Cases

821 cases of chickenpox were reported to the Utah Department of Health with onset dates in 2007.

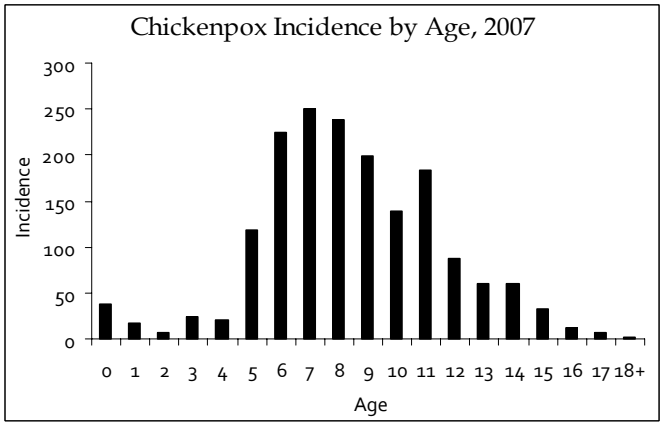


Incidence Rate

The incidence of chickenpox in Utah for 2007 was 30.0 cases per 100,000 population. The incidence of chickenpox in the United States for 2007 was 8.8 cases per 100,000 population.

Monthly Distribution

The greatest number of cases occurred in January, with 146 cases reported. In the previous four years, the greatest number of cases have been reported in winter months. The summer months have a low number of cases, not because of absence of disease, but because of the loss of the major reporter – schools.



Age Distribution

Chickenpox was most frequently diagnosed in children 6-8 years old.

Vaccination

Vaccination status was known for 75% of cases. Of those with a known vaccination status, 76% had received at least one dose of a varicella-containing vaccine.

Diphtheria

Background

Clinical Description

Diphtheria is a toxin-mediated bacterial disease with two manifestations. Respiratory diphtheria is characterized by the presence of a membrane that is usually visible over the tonsils or the throat. The membrane is not easy to remove, and may obstruct breathing and can be life threatening. The respiratory form of diphtheria usually lasts several days, and complications can persist for months. Cutaneous diphtheria is usually mild and is characterized by nondistinctive sores or shallow ulcers.

Public Health Responsibility

All suspected and confirmed cases of diphtheria, respiratory and cutaneous, should be immediately reported to public health. Public health is responsible for promoting vaccination to maintain disease control, ensuring laboratory confirmation of disease, rapidly identifying cases and ensuring appropriate isolation, identifying contacts and ensuring appropriate prophylaxis, and coordinating antitoxin release from CDC.

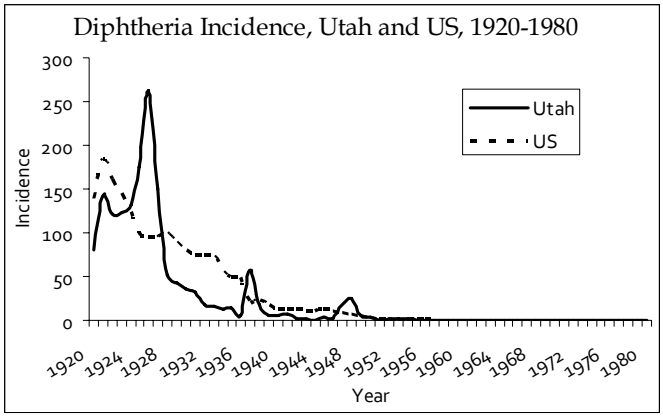
2007 Utah Summary

Reported Cases

There were no cases of diphtheria reported to the Utah Department of Health in 2007, although one suspect case was investigated and ruled out.

Incidence Rate

The incidence of diphtheria in Utah and the US has decreased dramatically since the first vaccine became available in 1923. In 1926, 1,271 cases of diphtheria occurred in Utah for an incidence rate of 292.4 cases per 100,000 population. The incidence rate of diphtheria in Utah is currently 0, as the last case of diphtheria in Utah was documented in 1960. In 1921, there were more than 200,000 cases of diphtheria reported in the United States. The last case of diphtheria in the United States occurred in 2003.



Haemophilus influenzae

Background

Clinical Description

Invasive disease due to *H. influenzae* may produce various clinical syndromes including meningitis, bacteremia or sepsis, epiglottitis, pneumonia, septic arthritis, osteomyelitis, pericarditis, empyema, and abscesses. Mucosal infections, such as bronchitis, sinusitis and conjunctivitis, and otitis media, can also be caused by *H. influenzae*, but they are considered to be noninvasive disease.

Public Health Responsibility

All cases of invasive disease due to *H.influenzae* should be reported immediately to public health. Public health is responsible for:

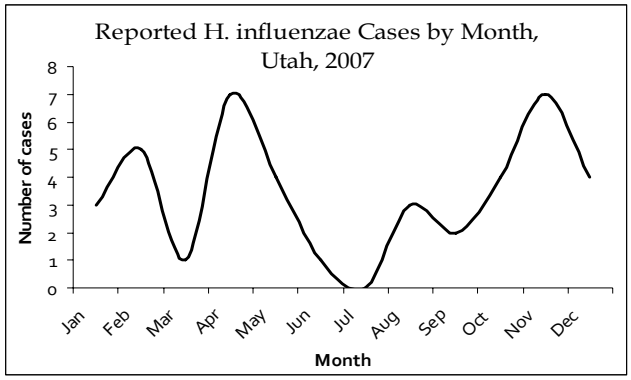
- Investigating all suspect cases of disease and filling out and submitting appropriate disease investigation forms.
- Providing education to the general public, clinicians, and first responders regarding disease transmission and prevention.
- Identifying clusters or outbreaks of this disease.
- Identifying sources of exposure and preventing further transmission.
- Identifying the emergence of *H. influenzae* types (other than serotype b) as causes of invasive disease.
- Monitoring Hib vaccine effectiveness.
- Assessing progress toward disease elimination.

2007 Utah Summary

Reported Cases

41 cases of *H. influenzae* (invasive disease) were reported to the Utah Department of Health in 2007. There were 9 deaths.

Incidence Rate



For 2007, the incidence of *H. influenzae* (invasive disease) in Utah was 1.51 cases per 100,000 population and the incidence of death due to *H. influenzae* (invasive disease) was 0.33 cases per 100,000 population. In the United States, the incidence of *H. influenzae* (invasive disease) in 2007 was 1.57 cases per 100,000 population and 0.23 cases per 100,000 population for deaths due to *H. influenzae* (invasive disease). There is no statistically significant difference between the rates in Utah and the U.S.

Serotype Distribution

The incidence of *H. influenzae* (invasive disease) serotype b in Utah and the United States in 2007 was 0.03 cases per 100,000 population. For non-serotype b isolates, the incidence in Utah 0.66 cases per 100,000 population, while the incidence in the United States was 0.38 cases per 100,000 population. For non-typeable isolates, the Utah

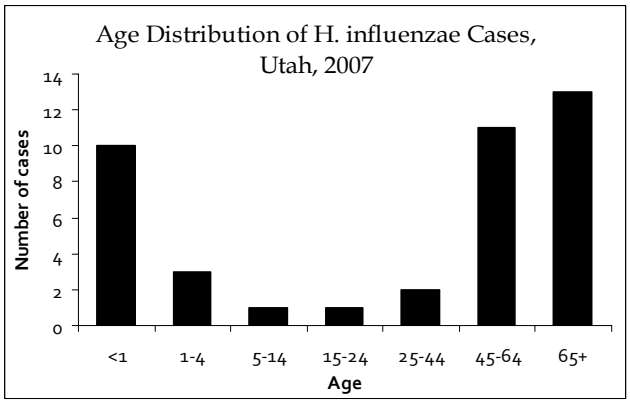
incidence was 0.66 cases per 100,000 population, compared to the United States incidence of 0.90 cases per 100,000 population. Five cases (12.1%) in Utah resulted in meningitis, compared with 6.4% nationally. Three of the 5 meningitis cases in Utah were due to serotype a.

Monthly Distribution

The monthly distribution of disease typically follows the pattern of respiratory pathogens (highest incidence from fall through spring).

Age Distribution

The age distribution of disease follows the pattern of invasive diseases; this disease predominates in the very young and the very old age groups.



Vaccination

The vaccine only protects against serotype b. Virtually all of the disease in Utah is due to other serotypes or non-typeable strains.

Hepatitis A

Background

Clinical Description

Hepatitis A is a self-limiting viral illness characterized by sudden onset of symptoms including malaise, fever, nausea, and diarrhea. Jaundice, characterized by yellowing of the skin or whites of the eye, dark urine, and clay-colored stool, may follow a few days after initial symptoms. Asymptomatic infections can occur, and are most common in young children. Symptoms typically last for several weeks, however, can last several months in cases with particularly severe disease.

Public Health Responsibility

All suspected and confirmed cases of hepatitis A should be reported to public health. Public health is responsible for identifying patient contacts and administering prophylaxis as needed. This may consist of vaccinating susceptible individuals and/or administering immune globulin to prevent new infections in these contacts. Public health is also responsible for identifying the source of infection for the patient and identifying other cases associated with the infection source.

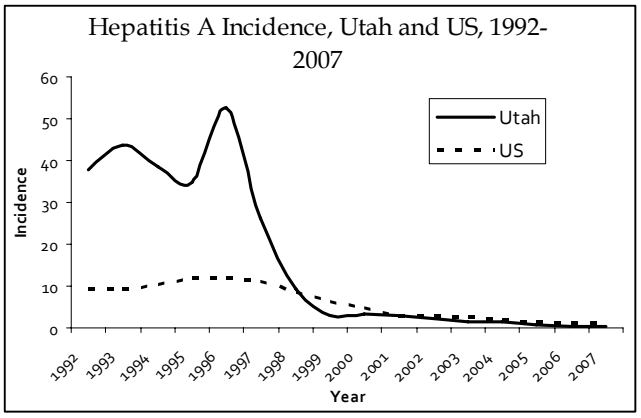
2007 Utah Summary

Reported Cases

There were 9 confirmed, 1 probable, and 14 suspected cases reported to the Utah Department of Health with onset dates in 2007. An additional 13 cases were investigated and determined to not be cases.

Incidence Rate

The incidence rate of hepatitis A in Utah for 2007 was 0.3 cases per 100,000 population. The incidence of hepatitis A in the United States for 2007 was 1.2 cases per 100,000 population.



Monthly Distribution

Confirmed cases had onset dates in January, February, June, July, August (2), and December (3). None of the cases were related.

Age Distribution

The 9 confirmed cases ranged in age from 10 years to 57 years, with an average of 38 years.

Hepatitis B (Acute)

Background

Clinical Description

Hepatitis B is a viral illness characterized by sudden onset of symptoms including malaise, fever, nausea, vomiting, and dark urine. Jaundice, characterized by yellowing of the skin or whites of the eye, light or gray stools, and hepatic tenderness follow 3-10 days after. Severity of the disease ranges from unapparent cases (detectable only by liver function tests) to fulminant, fatal disease. Asymptomatic infections are common in children <10 years old, and occur in approximately 30–50% of older children, adolescents, and adults. Most persons acutely infected completely recover from the disease with no complications. However, 1-2% may develop fulminant hepatitis. The majority of complications occur with chronic infection. Chronic infection may result in chronic hepatitis, cirrhosis, liver failure, and hepatocellular carcinoma.

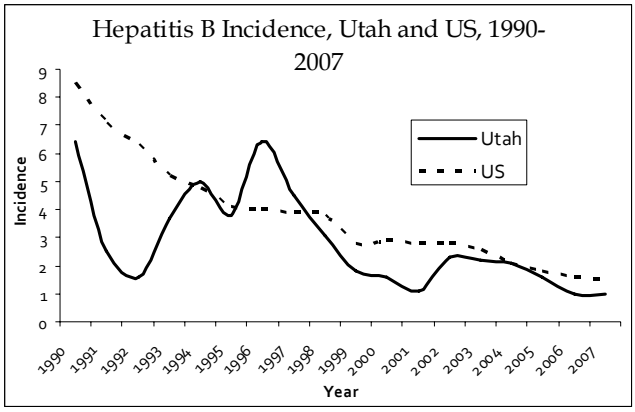
Public Health Responsibility

All suspected and confirmed cases of hepatitis B should be reported to public health. Public health is responsible for identifying clusters and outbreaks, identifying sources of exposure to stop further transmission, and identifying infected pregnant women to prevent perinatal transmission to their babies.

2007 Utah Summary

Reported Cases

In 2007, 14 confirmed and 2 suspect cases of acute hepatitis B were reported to the Utah Department of Health. Six cases were ruled out as not being acute infections of hepatitis B.



Incidence Rate

The incidence of hepatitis B in Utah for 2007 was 1.0 cases per 100,000 population. The incidence in the United States was 1.6 per cases 100,000 population.

Monthly Distribution

The 14 confirmed cases had onset dates or lab test dates in January, February (2), May, June, August, September (2), October (2), and November (4).

Age Distribution

Ages ranged from 18 to 56 years, with an average age of 35 years.

Gender Distribution

There were 10 confirmed cases in males, and 4 in females.

Measles (Rubeola)

Background

Clinical Description

Measles is an acute viral rash illness. The disease begins with a non-specific prodrome characterized by a high fever, with malaise, cough, coryza (runny nose), or conjunctivitis. A maculopapular rash develops soon after and usually lasts 5–6 days. The rash begins on the face, and over the next few days extends to the body and extremities. Koplik spots, blue-white spots that generally develop on the mucosa of the mouth, are a characteristic sign of measles disease.

Public Health Responsibility

All suspected or confirmed cases of measles should be reported to public health immediately. Public health is responsible for promoting vaccination to maintain disease elimination, rapidly identifying cases and ensuring appropriate isolation, rapidly identifying susceptible contacts and ensuring appropriate prophylaxis through vaccination or administration of immune globulin (IG), coordinating appropriate laboratory testing, and identifying the source of infection through genotyping of viral isolates.

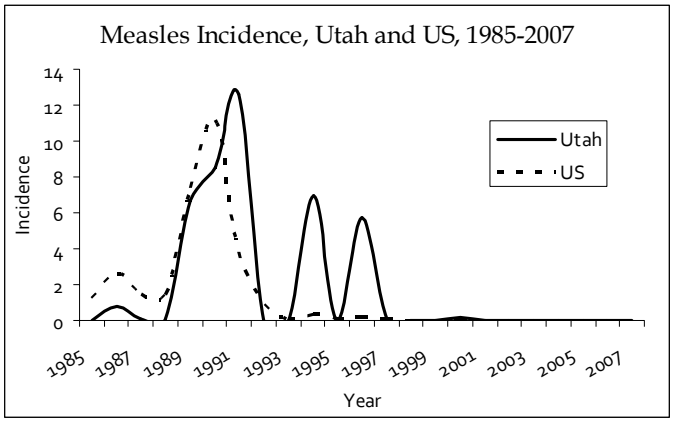
2007 Utah Summary

Reported Cases

In 2007, 11 suspected cases of measles were investigated in Utah. No confirmed cases occurred. Sixty-six Utahans had to be contacted because of exposure to a confirmed case at an out-of-state conference. The last case of measles in Utah occurred in 2004.

Incidence Rate

Due to uniform vaccination of infants, the incidence of measles in Utah and the United States has decreased substantially. For 2007, the incidence rate of measles in Utah was 0 cases per 100,000 population, while the incidence rate of measles in the United States for 2007 was 0.01 cases per 100,000 population. The wild measles virus has been eliminated from the Americas for several years, and cases that occur are due to importation of the virus from elsewhere in the world.



Meningococcal Disease

Background

Clinical Description

Meningococcal disease, caused by the bacterium *Neisseria meningitidis*, can present with varied clinical manifestations, including bacteremia without sepsis, meningococcemia, meningitis, meningoencephalitis, pneumonia, epiglottitis, urethritis, arthritis, and pericarditis. Patients can progress between manifestations during their course of illness. Meningococcemia is the most severe presentation of this disease. Petechial lesions are common with this disease, but can be missed. Lesions can occur in obscure places such as the hard palate and conjunctiva, but are generally seen on the trunk and lower limbs. The petechia rash corresponds to thrombocytopenia and is an indicator of disseminated intravascular coagulopathy (DIC). Some patients may also present with a maculopapular rash, but it is transient.

Public Health Responsibility

Public health has the primary responsibility for identifying and chemoprophylaxing contacts to identified cases. Other important public health responsibilities include:

- Investigating cases to determine possible linkage to other cases in Utah or beyond.
- Collecting demographic information to identify "at risk" populations.
- Encouraging "at risk" populations to receive immunization.
- Monitoring levels of disease in the community.
- Analyzing disease trends.
- Tracking age distribution and types of invasive meningococcal disease reported to public health to determine whether a transition from a non-epidemic to an epidemic period is occurring.
- Monitor reported serogroups, collecting and reporting sufficient information to determine whether there is a changing pattern and whether vaccine is covering the majority of reported cases.

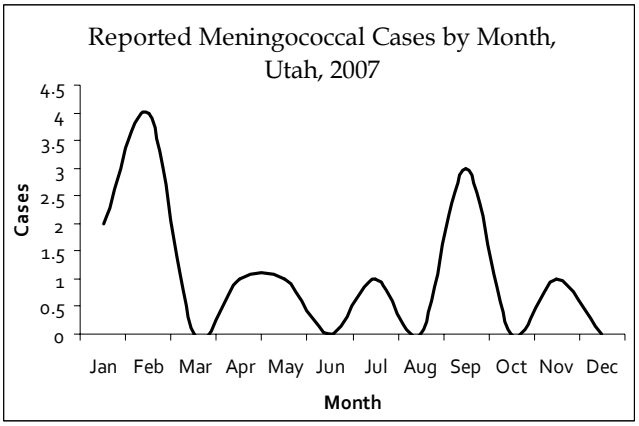
2007 Utah Summary

Reported Cases

Thirteen reported cases (12 confirmed and 1 suspect) of invasive meningococcal disease occurred in Utah in 2007.

Incidence Rate

The incidence of invasive meningococcal disease in Utah was 0.48 cases per100,000 population. This is not statistically different than the national incidence of 0.33 cases per 100,000 population, and is well below the Healthy People 2010 goal of 1 case per 100,000 population.



Monthly Distribution

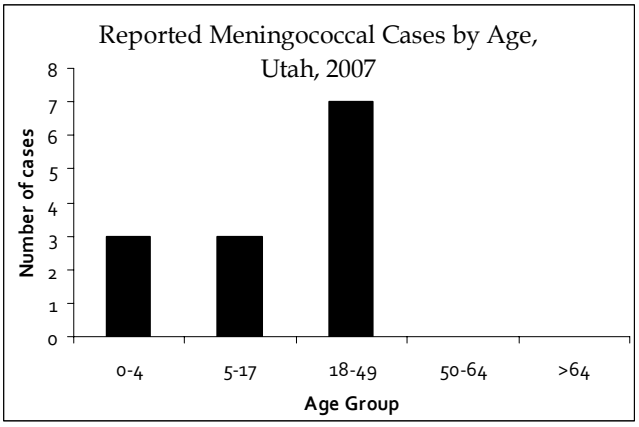
Cases are generally found between fall and spring, but due to the low number of cases, the distribution pattern in one year can appear to be somewhat random.

Serotype Distribution

Of the 12 confirmed cases in Utah, there were 5 serotype Y, 1 C, 2 B, 3 A, and 1 non-typeable. For the past several years, Utah's rates of disease due to serotype Y have been higher than the national average, and the rate of disease due to serotype B has been lower than the national average.

Age Distribution

This disease affects children and young adults disproportionately.



Mumps

Background

Clinical Description

Mumps is a moderately contagious viral illness. The disease usually begins with prodromal symptoms that include body aches, loss of appetite, tiredness, headache, and a low-grade fever. The most common manifestation of mumps is parotitis, which consists of swelling and tenderness in the salivary glands. Parotitis usually develops 2 days after prodromal symptoms and usually resolves within 10 days of onset.

Public Health Responsibility

All suspected or confirmed cases of mumps should be reported to public health. Public health is responsible for promoting vaccination to prevent disease, rapidly identifying cases and ensuring appropriate isolation, and coordinating appropriate laboratory testing.

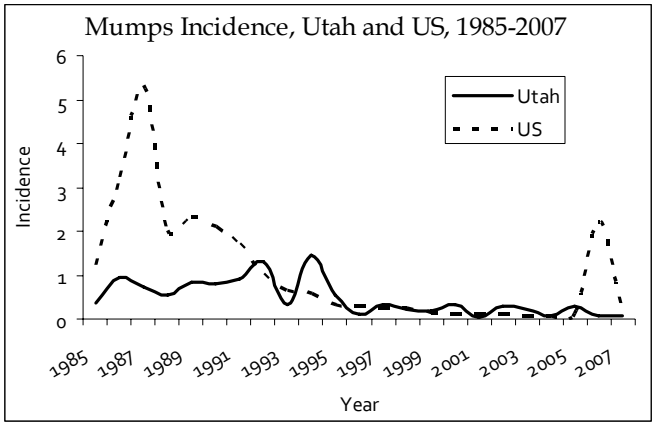
2007 Utah Summary

Reported Cases

Two confirmed cases of mumps were reported to the Utah Department of Health with onset dates in 2007. Eleven suspected cases of mumps were ruled out by local health departments during the year.

Incidence Rate

The incidence of mumps in Utah for 2007 was 0.1 cases per 100,000 population. The incidence of mumps in the United States for 2007 was 0.3 cases per 100,000 population.



Monthly Distribution

Both cases had onset dates in November, but they were not related. Source of infection for one case was a recent trip to Las Vegas, NV where several cases had been identified. The source for the other case is unknown.

Age Distribution

Both cases were adults over the age of 25 years.

Vaccination

One case reported vaccination as a child, and the other case was unvaccinated.

Pertussis

Background

Clinical Description

Pertussis, also called whooping cough, is a highly contagious toxin-mediated bacterial disease that interferes with the body's ability to clear pulmonary secretions. Symptoms of pertussis include sudden, severe coughing fits (paroxysms). These fits are often followed by a high-pitched whoop when the person breathes in. Persons may become cyanotic due to a lack of oxygen, and may vomit after a coughing fit.

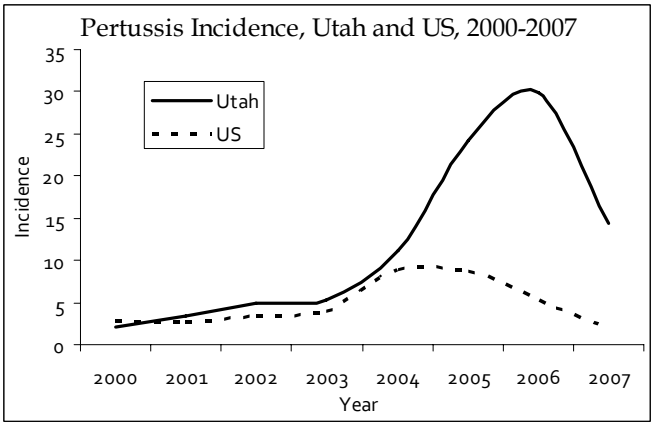
Public Health Responsibility

All cases of pertussis, regardless of laboratory testing, should be reported to public health. Public health is responsible for promoting vaccination in order to reduce the disease burden on the community, rapidly identifying cases and ensuring appropriate isolation, and ensuring that appropriate prophylaxis is given to prevent disease in high-risk individuals (children less than 1 year old and pregnant women) and their contacts.

2007 Utah Summary

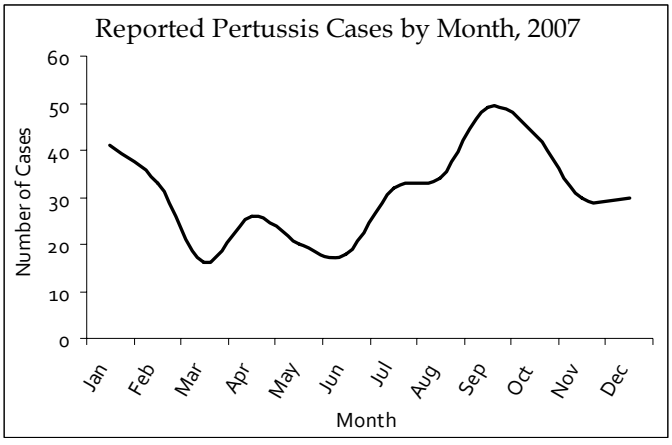
Reported Cases

In 2007, 372 cases of pertussis were reported to the Utah Department of Health with onset dates within the year. Of these, 142 (38%) of cases were confirmed and 230 (62%) cases were probable.



Incidence Rate

From 2000 to 2006 the incidence of pertussis in Utah increased from 2.1 cases per 100,000 population to 29.9 cases per 100,000 population. However, in 2007 the incidence rate decreased substantially to 14.3 cases per 100,000 population. The incidence of pertussis in the United States in 2007 was 1.8 cases per 100,000 population.

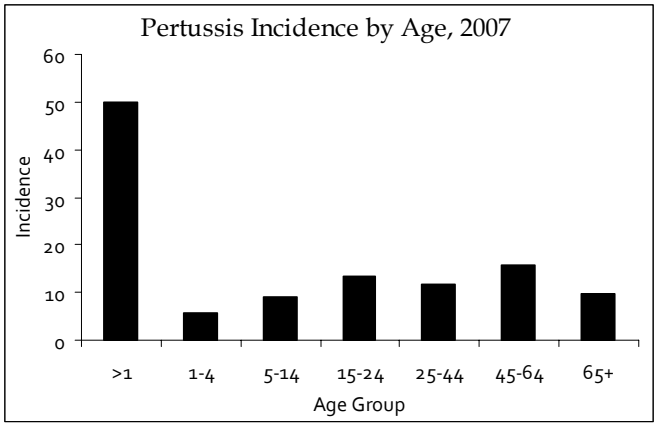


Monthly Distribution

Pertussis activity varied substantially throughout the year. Activity markedly decreased in March, and remained low through June. During this time period, an average of 20 cases a month occurred. Activity began to increase in July, and remained high through October. During this time period, an average of 40 cases per month occurred.

Age Distribution

The greatest disease burden in Utah continues to be in children under one year of age, who also happen to be at the most risk for complications and death from pertussis. The incidence of pertussis in children less than one in 2007 was 49.8 cases per 100,000 population, which is more than four times higher than the incidence rate in the rest of the population (11.8 cases per 100,000 population).



Vaccination

Of the 85% of cases with a known vaccination status, 287 (91 %) had received at least 1 dose of vaccine. The median age of cases that had been previously vaccinated was 26 years, while the median age of cases that had never been vaccinated was 14 years. This suggests that waning immunity is an important factor in the development of pertussis as an adult.

Poliomyelitis

Background

Clinical Description

Poliomyelitis is a viral infection. The severity and clinical manifestations of poliovirus infection are highly variable. Nearly 95% of poliovirus infections have mild or no symptoms. Paralytic poliomyelitis is characterized by asymmetric, acute flaccid paralysis with loss of reflexes in the involved limbs. It occurs in only 0.1-2% of cases and usually presents with fever. Paralytic symptoms usually begin 1-10 days after prodromal symptoms and will progress for 2-3 days. Weakness or paralysis still present 12 months after onset is usually permanent.

Public Health Responsibility

All poliovirus infections, paralytic and non-paralytic, should be reported to public health. Public health is responsible for promoting vaccination in order to maintain disease elimination, rapidly identifying cases and ensuring appropriate isolation, and identifying sources of exposure and stopping further transmission

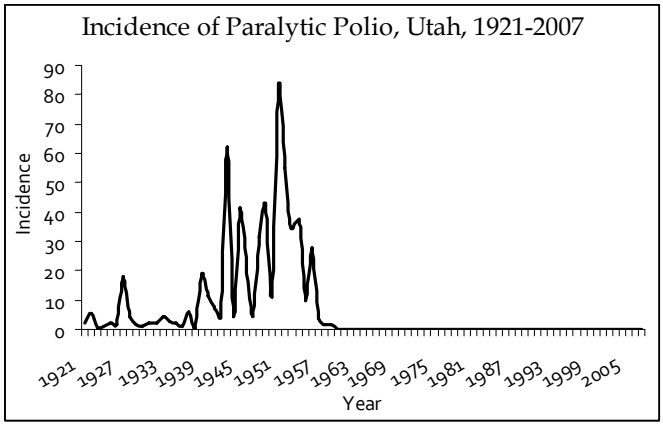
2007 Utah Summary

Reported Cases

No cases of polio were reported in Utah for 2007. Utah had one case of paralytic polio in 1996, and prior to that, the last case occurred in 1959.

Incidence Rate

The incidence of polio in Utah and the United States has decreased substantially since the introduction of the vaccine in 1955. In fact, it took less than 5 years to essentially eliminate polio transmission in Utah since vaccination started. In 1951 in Utah, 585 cases of paralytic polio occurred with an incidence rate of 82.9 cases per 100,000 population. In the US, the incidence of polio cases decreased by 99% from 11.2 cases per 100,000 population in 1954 to 0.1 cases per 100,000 population in 1964.



Rubella

Background

Clinical Description

Rubella is a moderately contagious viral illness. When contracted after birth, rubella is usually a mild disease characterized by a generalized maculopapular rash, swollen lymph nodes, and slight fever. The rash usually begins on the face and then progresses from head to foot. Infection with rubella during early gestation can result in a variety of physical abnormalities referred to as Congenital Rubella Syndrome (CRS). CRS can have a multitude of manifestations, including deafness, blindness, heart defects, behavioral disorders, mental retardation, growth retardation, bone disease, enlarged liver and spleen, thrombocytopenia, and purple skin lesions. Symptoms of CRS may not develop for 2-4 years.

Public Health Responsibility

All suspected and confirmed cases of rubella and CRS should be reported to public health. Public health is responsible for promoting vaccination in order to maintain disease elimination, rapidly identifying cases, ensuring appropriate management of exposed pregnant women, coordinating appropriate laboratory testing, and identifying the source of infection through genotyping of viral isolates.

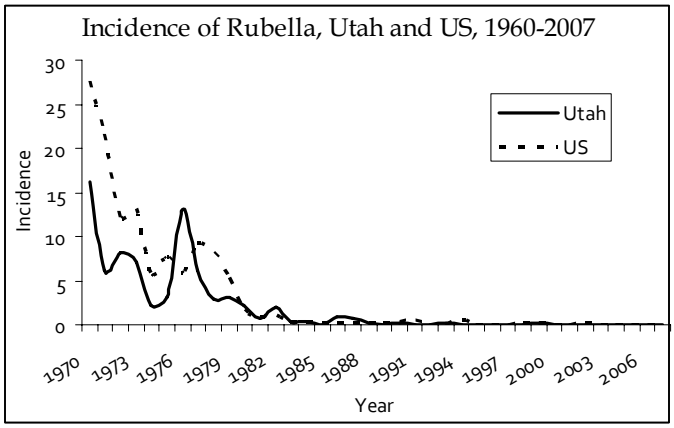
2007 Utah Summary

Reported Cases

In 2007, 12 suspected cases of rubella were investigated in Utah. No confirmed cases occurred.

Incidence Rate

The last case of rubella in Utah occurred in 2004. Since 2001, an average of 13 cases per year are reported in the US for an incidence rate of 0.03 cases per 100,000 population, whereas in the 3 years prior to the introduction of the vaccine in 1969, an average of 47,745 cases of rubella were reported in the US, for an incidence rate of 24.0 cases per 100,000 population.



Streptococcus pneumoniae

Background

Clinical Description

Streptococcus pneumoniae (Strep pneumo) is the most common cause of bacterial pneumonia and bacterial meningitis in the United States. It is also the most common cause of acute otitis media and invasive bacterial infections in children. Strep pneumo is a common cause of sinusitis and conjunctivitis in children. Strep pneumo occasionally causes endocarditis, osteomyelitis, pericarditis, pyogenic arthritis, soft tissue infection, and early-onset neonatal septicemia.

Public Health Responsibility

Public health's responsibility is to assure that:

- Children and people over 60 are being vaccinated.
- Disease is not increasing in vaccinated individuals, thus indicating the emergence of replacement strains in a community.
- Cases of disease primarily occur in expected age groups or individuals with appropriate medical histories, thus indicating that increased pathogenicity of the organism is not occurring.
- Outbreaks of antibiotic resistant organisms are detected and communicated to physicians.

2007 Utah Summary

Reported Cases

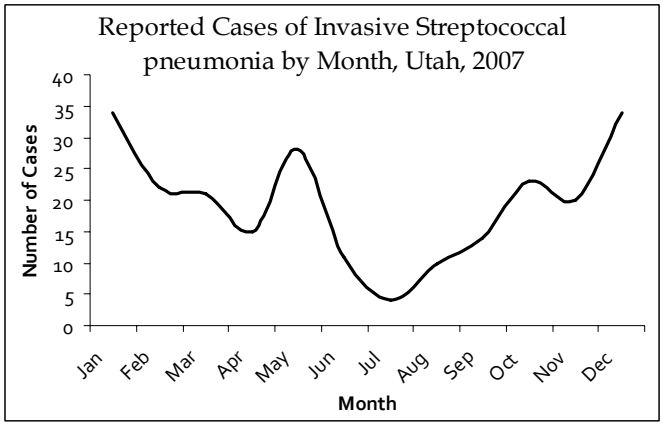
In 2007, 237 cases of invasive disease due to Strep pneumo were reported in Utah. This is up slightly from 210 cases reported in 2006.

Incidence Rate

The incidence rate of Strep pneumo in Utah for 2007 was 8.8 cases per 100,000 population, compared to the incidence rate in the United States of 14.0 cases per 100,000 population. The incidence rate of death due to this disease in Utah was 1.0 cases per 100,000 population, while the national incidence rate was 1.5 cases per 100,000 population. While Utah rates differ from national rates, we continue to have incomplete reporting of this disease, probably due to the parameters of reporting only cases from sterile sites. At this time, there is no reason to believe that the rate of disease in Utah differs significantly from that in the United States.

Monthly Distribution

The monthly distribution of Strep pneumo follows that of other invasive bacterial diseases, namely, increased cases from fall through spring.



Antibiotic Susceptibility

21.7% of cases were non-susceptible to any antibiotic (down from 31.6% in 2006). Notable antibiotics exhibiting non-susceptibility (in Utah) were penicillin (17%),

erythromycin (6%), trimethoprim-sulfamethoxazole (8%), and azithromycin (5%). No resistance was seen to vancomycin during 2007.

Age Distribution

The age distribution of this disease follows that of other invasive bacterial diseases, namely, increased rates in those under 5 years and those over 50 years of age.

Vaccination

Of children under the age of 5 years with invasive pneumococcal disease in Utah, 11 did not receive vaccination and 31 had received at least one dose. It is more difficult to track vaccination data on adults over the age of 60 years. Roughly equal numbers of these adults were vaccinated, not vaccinated, or had unknown vaccination status. At this time, Utah does not receive funding to determine serotypes of the disease to determine whether ongoing disease occurrence is due to replacement strains.

Tetanus

Background

Clinical Description

Tetanus is an acute toxin-mediated bacterial disease characterized by generalized rigidity and convulsive spasms of skeletal muscles.

Public Health Responsibility

All cases of tetanus should be reported to public health. Public health is responsible for promoting vaccination in order to prevent disease and investigating cases to ensure that appropriate vaccination and antitoxin recommendations are followed.

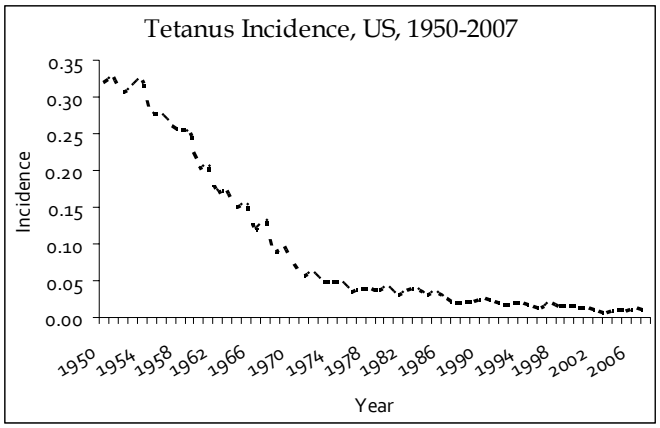
2007 Utah Summary

Reported Cases

In 2007, one suspected case of tetanus occurred in Utah; this case was ruled out.

Incidence Rate

The incidence rate of tetanus in the United States has decreased by more than 97% from 0.3 cases per 100,000 population in 1950 to 0.01 cases per 100,000 population in 2007.



Vaccinia

Background

Clinical Description

Vaccinia virus infection is very mild and is typically asymptomatic in healthy individuals, although it may cause a mild rash and fever. The vaccinia virus is used as the infectious agent in the smallpox vaccine. Because the smallpox vaccine is a live virus vaccine, improper vaccine-site management can result in vaccinia infection of the vaccine recipient or contacts of the vaccine recipient.

Public Health Responsibility

Adverse events after smallpox vaccination, which include accidental vaccinia inoculation, should be reported to public health. Public health is responsible for coordinating appropriate laboratory testing, reporting adverse events through the Vaccine Adverse Events Reporting System (VAERS), notifying the vaccinating agency, and coordinating the administration of vaccinia immune globulin intravenous (VIGIV) for the treatment or modification of eczema vaccinatum, progressive vaccinia, and severe generalized vaccinia.

2007 Utah Summary

Reported Cases

Two suspected cases of vaccinia were investigated in 2007, neither of which was confirmed. One case was a relative of a vaccinee; the other was a vaccinee with a potential auto-inoculation.